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Liquid crystal device, and display method and display system making use of it.

(f) A liquid crystal device comprises a pair of opposing substrates and a liquid crystal rendering a chiral smectic phase, disposed between said pair of substrates, wherein at least one of the substrates is provided with an alignment film comprising a polymer containing a skeleton selected from the group consisting of acetylene. phenylene. phenylenevinylene, phenylenexylidene. benzyl. phenylene sulfide, dimethylparaphenylene sulfide, thienylene, furan, selenophene, vinylpyridine, vinylnaphthalene. vinylferrocene, vinylcarbazole. phenylene oxide, phenylene selenide, heptadiyne, benzothiophene, thiophene, pyrrole, aniline and

naphthylene. The liquid crystal device is used for a display system and effects a high contrast display without after-image.



### **EUROPEAN SEARCH REPORT**

Application Number

EP 91 10 3929

	DOCUMENTS CONSID	ERED TO BE RELEVAN	T	
ategory	Citation of document with indi- of relevant passa	cation, where appropriate, ges	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
	PATENT ABSTRACTS OF J vol. 012, no. 104 (P- & JP-A-62 237 431 ( 0 1987 * abstract *	APAN 685)6 April 1988		G02F1/1337 G02F1/137
	PATENT ABSTRACTS OF 3 vol. 006, no. 141 (P- & JP-A-57 064 211 ( 0 * abstract *	131)30 July 1982		
4	EP-A-0 177 271 (I.C.			
4	EP-A-0 299 664 (I.C.)	(.)		
				TECHNICAL FIELDS SEARCHED (Int. Cl.5)
				G02F
	The present search report has be	en drawn up for all claims		
	Place of search	Date of completion of the search		Exeminer
	THE HAGUE	06 AUGUST 1993		LEROY ALAIN
Y:p d A:t	CATEGORY OF CITED DOCUMEN articularly relevant if taken alone articularly relevant if combined with anot ocument of the same category schnological background	E : earlier patent after the filing ber D : document dte L : document de	document, but put put put date I do the applicati I for other reason	iblished on, or
O: n	on-written disclosure stermediate document	& : member of the document	same patent 121	nily, corresponding



### **EUROPEAN SEARCH REPORT**

**Application Number** EP 99 20 3378

Category	Citation of document with of relevant pass	ndication, where appropriate, sages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CL7)
X	US 5 465 169 A (EGU 7 November 1995 (19 * column 5, line 36		1–12	G02F1/1337
X	SEO D -S ET AL: "A ANGLE GENERATION IN (5CB) ON RUBBED POL WITH ALKYL CHAIN LE JAPANESE JOURNAL OF	1,12		
	JOURNAL OF APPLIED	June 1996 (1996-06-01), 2000735519	·	
X	EP 0 449 047 A (CANON KK) 2 October 1991 (1991-10-02) * page 4, line 21 - line 52 *		1,12	
				TECHNICAL FIELDS SEARCHED (Int.CL7
				G02F
	The present search report has been drawn up for all claims			
	Place of search	Date of completion of the search	L.,	Examiner
	THE HAGUE	23 February 2000	Dio	ot, P
X : part Y : part doc A : tech	ATEGORY OF CITED DOCUMENTS doularly relevant if taken alone doularly relevant if combined with and ument of the same category mological background	E : earlier patent doc after the filing dat ther D : document cited in L : document cited fo	xument, but public en the application or other reasons	Ished on, or
	n-written disclosure rmediate document	& : member of the sa document	une patent famil	y, corresponding

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 99 20 3378

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-02-2000

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5465169	A	07-11-1995	JP JP	6075226 A 6123888 A	18-03-1994 06-05-1994
EP 0449047	A	02-10-1991	JP CA DE US	4211225 A 2038369 A,C 69131261 D 5239398 A	03-08-1992 16-09-1991 01-07-1992 24-08-1993

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